

### **Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Currently Amended) A method of identifying the best matches or sets of matches between a query item and an item or items from a data set, the method comprising the steps of:
  - (i) providing a data representation for each item in the data set;
  - (ii) providing a query representation of the query item;
  - (iii) defining a transformation space;
  - (iv) for each of a number of regions spanning the entire transformation space, determining an upper bound to the probability of a global match between the query representation and a data representation under any global transformation in the region;
  - (v) automatically determining a global threshold probability based on the upper bound determined in (iv);
  - (vi) comparing the upper probability bound of each region with the global threshold probability; ~~and~~
  - (vii) determining regions having an upper probability bound greater than the global threshold probability, so as to identify solution regions;
  - (viii) sub-dividing the solution regions into further regions which span the solution regions;
  - (ix) determining a new upper bound to the probability of a global match between the query representation and a data representation under any global transformation in the further regions;
  - (x) determining a new global threshold probability based on the new upper bound; ~~and~~
  - (xi) determining new solution regions.
2. (Cancelled)
3. (Currently Amended) A method as claimed in claim 1[[2]], including the step of iterating ~~the further method~~ steps (viii) to (xi) ~~of claim 2~~ so as to identify the solution region

containing the best matching solution or to identify a set of solution regions containing a set of best matching solutions.

4. (Original) A method as claimed in claim 1, in which the data representations are topological representations of the data items and the query representation is a topological representation of the query item.

5. (Original) A method as claimed in claim 4, in which the topological representation of the data items and query item comprises a set of node measurement vectors, each node measurement vector being associated with a node of a topological arrangement of nodes defining the items.

6. (Original) A method as claimed in claim 1, in which the upper bound is determined using Bayesian probability theory.

7. (Currently Amended) A matching engine for identifying an item or items from a data set, the engine comprising electronic data processing apparatus including:

a memory storing a data representation for each item in the data set;

an input for inputting a query representation of the query item; and

a processor configured to which includes means for

~~defining~~ define a transformation space,

~~means for generating~~ generate a number of regions of the transformation space

spanning the entire transformation space,

~~means for determining~~ determine for each region an upper bound to the

probability of a global match between the query representation and a data representation under any global transformation in the region,

~~means for determining~~ determine a global threshold probability based on the

upper bound,

~~a comparison means which compares~~ compare the upper probability bound for

each region with the global threshold probability,

~~means to~~ identify solution regions having an upper probability bound greater than the global threshold probability,

sub-divide the solution regions into further regions which span the solution regions.

determine a new upper bound to the probability of a global match between the query representation and a data representation under any global transformation in the further regions;

determine a new global threshold probability based on the new upper bound;

determine new solution regions; and means to

store an identification of a match between the query item and the item of the data set in a memory.

8. (Original) A computer program which when running on a computer carries out a method as claimed in claim 1.

9-10. (Cancelled)

11. (New) A computer readable medium bearing computer program code providing instructions causing a computer to carry out the data processing operations of:

- (i) provide a data representation for each item in the data set;
  - (ii) provide a query representation of the query item;
  - (iii) define a transformation space;
  - (iv) for each of a number of regions spanning the entire transformation space, determine an upper bound to the probability of a global match between the query representation and a data representation under any global transformation in the region;
  - (v) automatically determine a global threshold probability based on the upper bound determined in (iv);
  - (vi) compare the upper probability bound of each region with the global threshold probability;
  - (vii) determine regions having an upper probability bound greater than the global threshold probability, so as to identify solution regions;
  - (viii) sub-divide the solution regions into further regions which span the solution regions;
  - (ix) determine a new upper bound to the probability of a global match between the query representation and a data representation under any global transformation in the further regions;
  - (x) determine a new global threshold probability based on the new upper bound;
- and

(xi) determine new solution regions.